

MICROBIOLOGISTS IN TRANSITION¹

G. M. DACK

Food Research Institute, University of Chicago, Chicago, Illinois

Microbiology was introduced into our institutions of higher learning around the beginning of the twentieth century. Then there were no trained microbiologists; early teachers were botanists, zoologists, chemists, and pathologists who strayed from their chosen fields of interest. In many colleges bacteriology was taught in the botany department. In medical schools bacteriology was taught in the pathology department. In industrial organizations the chief chemist was concerned with microbiological problems. In 1953 vestiges of these practices are still present. For example, in smaller colleges microbiologists operate under the chairmen of the botany departments. In industry microbiologists frequently report to a chief chemist. In hospitals microbiologists are accountable to pathologists who direct the laboratories.

In the early years of the study of microbiology, laboratory methods were inadequate. My teacher, Dr. E. O. Jordan (trained as a zoologist), studied colonies of bacteria on gelatin placed between two sterilized pieces of plate glass. As agar was procured, the horizons of experimentation were extended. Much study was given in early time to morphology of microorganisms and to their differentiation on the basis of their biochemical activities in various substrates. When studies were introduced on hydrogen ion concentration and indicator dyes were available, there was a heyday among microbiologists; pH was considered in all microbiological activity. In the twenties, oxidation reduction potential studies became popular. As time elapsed new and improved methods added knowledge to the basic studies initiated in the 1890's concerning cellular immunity, toxins and antitoxins. Great advances were made in the fields of bacterial physiology, viral and rickettsial diseases, and in the antibiotics and fermentation industries. The work of the medical microbiologists has been modified by the introduction of sulfa drugs and antibiotics.

As your representative, I have given serious consideration to the Society of American Bacteriologists in meeting the needs of today's microbiologist. Obvious to all of you is the fact that microbiology is rapidly becoming a highly specialized field. Our Society has an obligation to take leadership and to direct its efforts to improvement of the profession to benefit not only our membership but also the public which the profession serves. The improvement of professional qualifications is listed in Article II of our constitution.

Our Society has a fluctuating membership since many members join and many drop out after a few years. Nevertheless, the Society's membership has trebled in the past decade. This fact means that more new members are added than resign.

¹ Taken from an address given at the annual banquet of the Society of American Bacteriologists in San Francisco, August 12, 1953.

To learn the fields of interest among microbiologists, I wrote the presidents and secretary-treasurers of the local branches of the Society to supply me with information concerning their members. Obviously not all members of the local branches are members of the Society of American Bacteriologists, nor are all members of the Society necessarily members of the local branches. Furthermore the interests of many individuals in educational institutions may be well classified in one of the specific fields. Such a sampling, however, does provide current information for a rough guide of the categories of specialization of microbiologists. Information secured from 27 of the 30 local branches was as follows:

1. Medical microbiologists (hospitals, state and municipal laboratories) . . .	1693
2. Educational institutions	1237
3. Pharmaceutical and biological industries	556
4. Not classified	479
5. Students	441
6. Fermentation industries (breweries, distilleries, antibiotic manufacturers)	419
7. Food and dairy products	228
Total	5053

Membership in the Society of American Bacteriologists is open to any person interested in the objectives of the Society, providing such person shall have been nominated in writing in due form by two members of the Society. Other provisions are the payment of dues, endorsement by majority of the Membership Committee, and certification by the Council. These requirements obviously would not qualify a member as a microbiologist. Perhaps it is wise to have qualifications for membership broad and general, especially since the field of microbiology has become so specialized that the language of one specialty may not be understood by that of another.

Since microbiologists have been hybridized from peripheral disciplines, there is no clear concept established for them as an entity. Some of our industrial membership, feeling the need for organization to marshal its strength, have found haven in the American Chemical Society. Specialty groups are being formed. The interests of microbiologists, whether involving pathogens or microorganisms of industrial importance, deal with enzymes and chemical reactions which are common denominators applicable to all fields. At present the Society of American Bacteriologists is the rallying center for these common interests.

If the Society is to fulfill the needs of its members, it must undergo changes and establish standards for microbiology. Our present standards are about where medicine was in the past century when a man who wanted to become a doctor studied with a doctor who was his preceptor. After a period of study the novice was finally licensed to practice medicine. When medical schools were accredited and specific courses and curricula were prescribed, better trained doctors were produced. However, the older generation continued to practice medicine, and their status was not affected by the new medical degree requirements.

In our Society changes in requirements for microbiologists likewise should be gradual and not retroactive to members established in the profession. We are

proud of our heritage, and in a healthy Society each generation should be better trained than the preceding one. There should be a certification of curricula and of institutions qualified to train microbiologists. The training of a microbiologist at a bachelor's degree level and at a master's degree level needs to be defined.

With a certification of curricula in microbiology and a cataloging of the facilities of institutions to meet this training program, a definition could then be established for a microbiologist. A sound program should improve the status of our members and should aid in job descriptions by civil service and industrial agencies.

A committee was established by the Society to study the problem of standards. This committee made specific recommendations which should remove microbiologists from a category of nonentity, and instead demand high standards in institutions training microbiologists. This program should not interfere with high standards of general education. It must produce personnel capable of becoming competent microbiologists.

The membership requirements in the Society of American Bacteriologists are general and almost anyone interested in the subject can secure membership. This problem needs further study and discussion among the membership. Thought should be given to whether more exacting membership requirements should be established and whether grades of membership are advisable.

Within the Society many different interests and specialties are represented. The largest group in the classified list were medical microbiologists, and the interest of this group is under study and investigation by the Society. The work of one of the subcommittees led to the proposal of the American Board of Medical Microbiology which was approved by the Society of American Bacteriologists. However, before this Board becomes a reality the approval of the other agencies is required.

The Committee on Certification and Problems of Personnel is concerned whether any group within the Society of American Bacteriologists might profit by a plan of certification. Obviously medical microbiologists not eligible to the American Board of Medical Microbiology are being considered by this Committee. This Committee will study the question of the advisability of certification among other groups which represent a sizable proportion of our membership.

A register of microbiologists was set up a few years ago but has not been kept up to date. With the fluctuation in the membership of the Society this task becomes large and expensive. Fields of specialization frequently change which also requires annual revision of such files. The standardization and certification of our membership should aid the Society in keeping an accurate register of its membership.

The Society realized some time ago the need for interpreting microbiology to the public and to other organizations. A public relations committee was established for carrying out this function. Their task should be made somewhat easier when the Society establishes standards.

The local branches are a vital part of the Society. A study should be made of membership qualifications for local branches and the relationship of membership

in the local branches to that of the national Society. There is need for better liaison between the branches and the Society. Since the membership of the local branches meets often, the issues affecting the Society should be debated therein, and branch councilors should attend the Society council meetings prepared to represent the thinking of the local branches. Problems of concern to the entire Society arising in the local branches should be scheduled for action and debate at the Society council meetings.

The Society is operating with inadequate financial provision for carrying out its functions. At the present time our members receive more for their membership dues than do members of comparable organizations. If committees are to be established to implement the needs of the membership, financial arrangements for their operations must be made. If the Society expects to better its status, it must be prepared to assume the financial obligations involved.

In conclusion, microbiologists have been in transition a long time, and the policies of the Society have not kept pace with their present day needs. My predecessors recognized these problems and appointed committees to study them and make recommendations for action by the Society. Some of the issues have been presented to you for action and others are in the making. Our profession must go forward, and it is only by the unselfish effort of each of us that our Society will meet the needs of our members.